ENERGY STAR® Set-top Box Program
Draft Specification
Version 2.0
February 25, 2000

The symbol for energy efficiency.

Below is the revised draft product specification for the ENERGY STAR Set-top Box Program. Per the requirements of the ENERGY STAR Program, a product must meet all of the identified criteria if it is to be qualified as ENERGY STAR compliant by its manufacturer.

1) Definitions: Below is a brief description of a set-top box and its common operational modes as relevant to the ENERGY STAR Program.

   A. Set-top Box: A commercially available electronic product encased in a single housing whose purpose is to receive, send, process, translate, and/or record signals that are then sent to a television or similar display device for viewing. Products currently covered under the TV/VCR and Home Audio/DVD Memoranda of Understanding (MOUs) are not eligible to qualify for the ENERGY STAR label under the Set-top Box Program. As the TV/VCR and Home Audio/DVD specifications are revised, EPA will make a concerted effort to coordinate and/or consolidate, as appropriate, the energy-efficiency specifications across the TV/VCR, Home Audio/DVD, and Set-top Box Programs.

   B. Standby/Low-power Mode: The lowest power state that the set-top box product model enters while connected to a power source. In this mode, the product appears to be "OFF" to the user, but may be capable of responding to a signal (e.g., a signal sent from a head end or data provider) and may continue to perform some functions (e.g., remote control sensing, time readout, and hard drive spinning). If the product is designed for a network environment, then it must retain network connectivity (e.g., communication with a head end or service provider) and the ability to wake up from a remote source in the standby/low-power mode. The manufacturer must ensure that the energy-saving features or design of the ENERGY STAR-compliant product do not interfere with or adversely impact the performance of the product.

   EPA Comments: Please note that the Standby/Low-power Mode defined above differs from the Standby Mode defined for the TV/VCR and Home Audio/DVD Programs. According to industry, the "traditional" Standby Mode provided in the TV/VCR and Home Audio/DVD Programs is not currently applicable to all types of set-top boxes. Hence, the Standby/Low-power Mode definition is fairly general and does not dictate product requirements in recognition that different boxes may perform different functions when turned "OFF." For additional information, please refer to the EPA Comment Box following Definitions on page 2.

   C. Active Mode: The mode in which the product is operational and has been turned "ON" by the user. The product is connected to a power source and is receiving, sending, processing, translating, and/or recording signals. The power requirement in this mode is typically greater than the power requirement in standby/low-power mode.

   D. Disconnect: The mode in which the product is disconnected from all external power sources.

EPA Comments: Above are brief descriptions of common operational modes for set-top boxes that EPA has observed in field tests conducted by/for EPA. To achieve the maximum energy savings without compromising performance, the ENERGY STAR specification will focus on standby/low-power mode, which was the consensus at the July 1999 meeting between EPA and set-top box industry representatives. (See www.energystar.gov for list of attendees.) EPA has purposefully avoided defining various standby/low-power modes based on the functionality provided in each mode (e.g., standby-passive, standby-active, etc.) for two reasons: 1) recognition of the variation in modes and functionality across product categories, and 2) desire to encourage simplicity in program design and implementation.

In Version 2.0 of the Draft Specification, modifications have been made to the set-top box and standby/low-power mode definitions to clarify EPA's intent and expectations.

2) Qualifying Products: For the purposes of this Program, set-top box products include the following: analog cable TV set-top boxes, advanced analog cable TV set-top boxes, digital TV converter set-top boxes, Internet access devices, video game consoles, videophone set-top boxes, set-top boxes with cable modems, digital cable TV set-top boxes, Direct Broadcast Satellite (DBS) systems, and personal video recorders (e.g., TiVo and Replay TV) and multimedia devices (i.e., terminals that offer new and enhanced services through the convergence of telecommunications, Internet, satellite, and digital electronics) with hard drive functionality. Combination set-top box products with two or more functions may also qualify for the label under this Program.

EPA Comments: EPA's interest in developing energy-efficiency guidelines for set-top boxes is driven by the following factors: 1) the identification of products with a large and growing installed base; 2) expectations of significant market growth; 3) evidence of considerable energy use by these products when consumers believe they are off; 4) the potential for more energy-efficient design that does not compromise performance, based on engineering analysis and manufacturer feedback; and 5) changing distribution and usage patterns that will provide consumers with more opportunities to choose energy-efficient models.

Given that these products share many common design characteristics and it is administratively more efficient to maintain one versus several ENERGY STAR Programs, EPA intends to cover a variety of products under one Set-top Box Program.

In Version 2.0 of the Draft Specification, the qualifying product list has been revised to specifically mention advanced analog cable TV boxes, set-top boxes with cable modems, multimedia devices with hard drive functionality, and combination boxes.

3) Efficiency Specifications for Qualifying Products: Only those products listed in Section 2 that meet the specifications outlined in Table 1 below may qualify as ENERGY STAR compliant. ***For combination products with two or more functions, manufacturers should identify the most energy-intensive function and then qualify the combination product under the category below that best describes the function. For example, a combination product with DBS and digital TV converter capabilities would be required to meet the 8-Watt specification as opposed to the 3-Watt specification.***

Table 1: DRAFT Criteria for ENERGY STAR–compliant Set-top Boxes

Product Category	**Standby/Low-power Mode**
Category 1 • Analog Cable TV Set-top Box • Advanced Analog Cable TV Set-top Box • Digital TV Converter Set-top Box • Internet Access Device • Video Game Console • Videophone Set-top Box • Set-top Box (e.g., Internet access device) with Cable Modem for enhanced communications in standby/low-power mode	≤ 3 Watts
Category 2 • Digital Cable TV Set-top Box • Direct Broadcast Satellite (DBS) System	≤ 8 Watts (not including antenna in DBS systems)
Category 3 • Personal Video Recorder • Multimedia Device (i.e., terminal that offers new and enhanced services through the convergence of telecommunications, Internet, satellite, and digital electronics) with Hard Drive Functionality	≤ 12 Watts (not including antenna, if applicable)

EPA Comments: Version 2.0 of the Draft Specification includes a number of significant revisions based on industry comments and suggestions. Specifically, EPA has made the following additions and revisions:

- *The 1-Watt specification proposed in Version 1.0 has been replaced with a 3-Watt specification for analog cable TV set-top boxes, advanced analog cable TV set-top boxes, digital TV converter set-top boxes, Internet access devices, video game consoles, videophone set-top boxes, and set-top boxes with cable modems. Please note that the 3-Watt specification covers more products with more power requirements than the initial 1-Watt specification provided in Version 1.0;*
- *A note has been inserted that excludes the antenna from power calculations for DBS systems;*
- *A 12-Watt specification (not including antenna, if applicable) for personal video recorders and multimedia devices with hard drive functionality has been developed. This specification replaces the 8-Watt specification proposed in Version 1.0; and*
- *The specification for combination products is more liberal in Version 2.0 in that it allows these products to qualify based on the most energy-intensive function as opposed to the function that best reflects how they are marketed and sold.*

While not included in this draft, EPA intends to develop a Tier 2 specification (similar to the approach in the Home Audio/DVD MOU) in order to extend the Program into a second phase. As product convergence continues, EPA believes that it will be both desirable and necessary to develop one specification for all set-top boxes. Further, EPA feels that developing a Tier 2 specification well in advance of its implementation date provides the following advantages: 1) it allows manufacturers to make long-term energy-efficiency design decisions with confidence that the specification won't change shortly thereafter, and 2) it reduces the administrative burden on both EPA and manufacturers because fewer industry meetings and written agreements are required.

Please note that the primary objective of the ENERGY STAR Programs is to recognize the most energy-efficient products in the market through the use of the ENERGY STAR label□a label well known by consumers and large purchasers as the symbol for energy efficiency. It is not EPA's intention to design a specification that will allow every model to qualify for the label. EPA believes that this draft specification will recognize a reasonable sub-set of the marketplace.

4) Power Measurement: The power requirement shall be measured from the outlet or power supply source to the product under test. The product manufacturer (i.e., ENERGY STAR Partner) shall measure the average true power (in Watts) of the product. When performing measurements to self-certify a product model, the products under test must be in the condition (e.g., configuration and settings) shipped to the customer. The test method to be used by manufacturers to self-certify their product(s) for ENERGY STAR compliance will likely be consistent with the Testing Guidelines for the ENERGY STAR® Home Electronics Program. Manufacturers are invited to provide comments and/or suggestions on the test method.

> *EPA Comments: Please note that one manufacturer has suggested a 24-hour period for product testing. Suggestions for alternative time periods (e.g., 4 or 6 hours) for measuring the average true power of the product are encouraged as well as feedback on other aspects of the test method.*

5) Other Information: The *final* version of the ENERGY STAR set-top box specification will be provided in the standard Memorandum of Understanding (MOU) format. In addition to the product specifications, other issues will be addressed such as the following.

- Buyer Information: In keeping with the spirit of the ENERGY STAR Program, the Partner will be expected to ensure that consumers have a quick and easy method of determining which of its products are ENERGY STAR compliant. To achieve this goal, EPA recommends that the Partner place the ENERGY STAR logo on all qualified product models, their packaging, and product-related materials such as brochures, manuals, advertisements, and Web sites. Further, to educate consumers about energy efficiency and its benefits, the Partner will provide one or more of the following: a description of the ENERGY STAR Program, a discussion of the energy-saving characteristics of the product, a description of the environmental benefits that result from the energy saved by the product, and/or a description of the potential energy-bill savings of the product. The Partner may determine the best manner to disseminate this educational information to customers (e.g., Web sites and brochures) such that it complements the Partner's existing strategy for promotional and informational materials. For example, one manufacturer included the following text in a recent product brochure:

  > "Even when your televisions are "off" they drain power. According to the U.S. Environmental Protection Agency, an ENERGY STAR–labeled TV consumes up to 75% less energy than the average TV when switched off. The ENERGY STAR label, a symbol for energy efficiency, was created by the U.S. Department of Energy and the U.S. Environmental Protection Agency to help identify products that can save money and protect the environment by saving energy."

  Upon request, EPA will review text prepared by Partners to ensure accuracy prior to printing and/or distribution.

- Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR compliant will be defined as the *effective date* of the MOU. This date is subject to negotiation with industry.

- Future Specification Revisions: EPA reserves the right to change the specifications should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specifications are arrived at through industry discussions.

EPA Comments: In order to focus EPA/industry discussions on the most crucial elements of the Program (i.e., the definitions and energy-efficiency criteria), EPA has provided this brief draft specification as opposed to a complete agreement. However, the draft and final versions of the agreement will have many of the standard sections of an ENERGY STAR agreement.

As noted above, the effective date and the duration of the agreement will be negotiated with industry. Please note that specifications for existing programs have remained in effect for two to four years before being replaced with new specifications to reflect market and/or technology changes. As always, EPA welcomes comments or alternative proposals from industry that address these issues. EPA deems industry feedback crucial to the successful development of ENERGY STAR Programs.